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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/221,291
Filing Date: December 23, 1998
Appellant(s): GRAHAM, MARTIN H.

Edwin Taylor
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 7/14/2008 appealing from the Office action mailed 1/25/2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

This application was previously appeals as *ex Parte* MARTIN H. GRAHAM, Appeal number 2006-2122.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,677,927	FULLERTON et al	10-1997
5,157,686	OMURA et al	10-1992
5,692,127	DEVON	11-1997
5,969,547	PERNYESZI	10-1999

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

I. Claims 19-22, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al (US 5,677,927) in view of Omura et al (US 5,157,686) further in view of Devon (US 5,692,127).

II. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al (US 5,677,927) in view of Omura et al (US 5,157,686) further in view of Devon (US 5,692,127) further in view of Pernyeszi (US 5,969,547).

The rejections are hereby reproduced for convenience.

I. Claims 19-22, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al (US 5,677,927) in view of Omura et al (US 5,157,686) further in view of Devon (US 5,692,127).

Regarding claims 19 and 25, Fullerton discloses a method of encoding data bits for transmission. In figure 10, an information source 1018 outputs data bits to a sub-carrier generator and modulator 1022. Manchester encoding of the digital data produces a digital modulated sub-carrier signal 1024. The sub-carrier time modulator 1016 uses the Manchester encoded data to pulse position modulate the coded timing signal 1014 (column 14, lines 44-57). Column 4, lines 1-10 also discloses the encoding data bits for transmission using Manchester encoding and pulse position modulation (PPM). Fullerton does not disclose the specifics of the Manchester encoding. Omura discloses how data is Manchester encoded and discloses a typical data sequence that is Manchester encoded. Figure 2 discloses a data sequence 0110101 and the corresponding Manchester encoded bits. As shown in figure 2, a first row of a data bit

sequence is shown comprising bits as 0110101. Also shown below each data bit are Manchester encoded bits. Each “0” bit of the data bit sequence is encoded as “01” Manchester encoded bit, and each “1” bit of the data bit sequence is encoded as a “10” Manchester encoded bit (column 7, lines 10-21). Manchester encoding is a phase encoding where each bit is encoded by a positive 90-degree phase transaction, or a negative 90-degree phase transition. Manchester code is sometimes known as a biphase code. Therefore, the Manchester encoded data in Omura discloses a first biphase pulse having a first portion of a first polarity (1) followed by a second portion of a second polarity (0). After waiting a first period of time (in this case zero seconds), a second biphase pulse having a third portion of the second polarity (0) followed by a fourth portion of the first polarity (1) is generated. After waiting a second period of time (zero seconds), another biphase pulse is generated having a first portion of a first polarity (1) followed by a second portion of a second polarity (0). After waiting another period of time (in this case zero seconds), an additional biphase pulse having a third portion of the second polarity (0) followed by a fourth portion of the first polarity (1) is generated. The sequence of 10101 is generated in Manchester coding and shown in figure 2. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the encoding of data according to Manchester encoding and transmit data as stated in Omura into the Manchester and PPM encoding system and method of Fullerton. Omura further describes how data is Manchester encoded in any Manchester encoding system. Though the combination of Fullerton and Omura discloses using Manchester encoding and PPM, the combination does not disclose the

specifics of the pulse position modulation. Devon discloses transmitting a pulse to represent a plurality of data bits as shown in figure 4. A first position of a pulse represents a “00”. The pulse in a second position represents a “01”. The pulse in a third position represents a “10”. The pulse in a fourth position represents an “11”. The pulse position modulation shown in figure 4 shows how data can be added to times when no data is being transmitted to increase the capacity of a system. More data can be sent that was sent previously. Figure 4 shows multiple bits being sent using PPM. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the method of encoding multiple bits using pulse position modulation as shown by Devon into the method and system of the combination of Fullerton and Omura for the reasons stated above. The combination of Fullerton and Omura already discloses using PPM.

Regarding claim 20, the biphasic pulse has no DC component since the positive amplitude is equal to the negative amplitude.

Regarding claim 21, the combination discloses transmitting bits. The bits will be transmitted as pulses. The pulses will have an amplitude and pulse width.

Regarding claim 22, the combination discloses transmitting bits. The bits will be transmitted as pulses. One amplitude represents a “1” bit while a second amplitude represents a “0” bit.

Regarding claim 24, the combination of Fullerton, Omura and Devon discloses a method for encoding a signal above. The combination does not disclose the transmission occurs over a twisted wire pair. However, the combination discloses the

transmission occurs in a system with minimal interference. It would have been obvious for one of ordinary skill in the art at the time of the invention transmit the signals generated by the combination in any transmission system that allows the information to be received at the desired location free of interference.

II. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al (US 5,677,927) in view of Omura et al (US 5,157,686) further in view of Devon (US 5,692,127) further in view of Pernyeszi (US 5,969,547).

Regarding claim 23, the combination of Fullerton, Omura and Devon discloses a method for encoding a signal stated in paragraph 3. The combination does not disclose the pulse width of each of the pulses represents at least one bit. Pernyeszi discloses pulse widths carry the information with a pulse's width representing a digital value (column 1, lines 17-25). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate Pernyeszi's method of pulse width encoding data into the method of the combination of Fullerton, Omura and Devon to transmit more information than either system is capable alone. Information can be transmitted over less time and the transmitter will consume less power due to the limited transmission time.

(10) Response to Argument

Prior to responding to the arguments, the examiner would like to review the reference relied upon in the previous rejections of the claims.

Description of Fullerton et al reference

Fullerton discloses a method of encoding data bits for transmission to a receiver. Figure 10 discloses the components of the transmitter, Manchester encoding of the digital data from information source 1018 is produced on digital modulated sub-carrier signal 1024 (mistakenly indicated as line 1204 in figure 10). Sub-carrier modulator 1016 uses the Manchester encoded data to pulse position modulate the coded timing signal 1014 (column 14, lines 52-57).

Description of Omura et al reference

Omura discloses a specific Manchester encoding system. Omura provides greater detail in the encoding process for transmitting meaningful data from a transmitter to a receiver. Figure 2 describes this encoding and provides a typical example of data to be encoded. Manchester encoding doubles the bit rate but ensures that there are sufficient transitions to allow a receiver to maintain synchronization on bit times (column 8, lines 7-16). As shown in figure 2, a first row of a data bit sequence is shown comprising bits as ‘0110101’. Also shown below each data bit are Manchester

encoded bits. Each “0” bit of the data bit sequence is encoded as “01” Manchester encoded bit, and each “1” bit of the data bit sequence is encoded as a “10” Manchester encoded bit (column 7, lines 10-21). Manchester encoding is a phase encoding where each bit is encoded by a positive 90-degree phase transaction, or a negative 90-degree phase transition. Manchester code is sometimes known as a biphase code. Therefore, the Manchester encoded data discloses a first biphase pulse having a first portion of a first polarity (1) followed by a second portion of a second polarity (0). After waiting a first period of time (in this case zero seconds), a second biphase pulse having a third portion of the second polarity (0) followed by a fourth portion of the first polarity (1) is generated. After waiting a second period of time (zero seconds), another biphase pulse is generated having a first portion of a first polarity (1) followed by a second portion of a second polarity (0). After waiting another period of time (in this case zero seconds), an additional biphase pulse having a third portion of the second polarity (0) followed by a fourth portion of the first polarity (1) is generated. Omura discloses implementing pulse position modulation in this Manchester encoding system (column 8, lines 7-9 and lines 59-62).

Description of Devon reference

Devon discloses a system and method for transmitting data encoded in a pulse position modulation signal (PPM). A communication device transmits information using PPM by transmitting a pulse during a pulse window that corresponds to the

symbol that represents information. A receiving device decodes the PPM signals by measuring the time between each pulse received and the previous received pulse. Additional steps are carried out to encode the data symbol transmitted from the transmitter.

Response to argument

Appellant does not appear to argue the limitations taught by Fullerton.

Appellant states Omura does not teach alternating the polarity of biphasic pulses as present in the appellant's invention. The examiner disagrees. Appellant concedes Manchester encoding is well known and uses one biphasic pulse to represent one binary state and a second biphase pulse to represent the other binary state in page 5, last paragraph of the appeal brief. Omura discloses the Manchester encoded bits shown in figure 2. The Manchester encoded bits discloses the claimed limitations recited in claim 19 and 25. Claim 19 recites a first biphase pulse having a first portion of a first polarity (1) followed by a second portion of a second polarity (0) (this is shown as the third encoded bit pair in figure 2). After waiting a first period of time (in this case zero second), a second biphase pulse having a third portion of the second polarity (0) followed by a fourth portion of the first polarity (1) is generated (this is shown as the fourth encoded bit pair). After waiting a second period of time (zero seconds), another biphase pulse is generated having a first portion of a first polarity (1) followed by a second portion of a second

polarity (0) (this is shown as the fifth encoded bit pair). After waiting another period of time (in this case zero second), an additional biphase pulse having a third portion of the second polarity (0) followed by a fourth portion of the first polarity (1) is generated (this is shown as the sixth encoded bit pair).

Appellant states if the encoding system in Omura alternated pulses it would only be able to encode the binary value '01' or '10' repeated indefinitely and this system would produce an inoperable result (page 6 of appeal brief). However, the claims recite four pulses. The preceding pulses and the subsequent pulses are not claimed. Therefore, the claimed invention does not restrict additional pulses of Omura. It merely requires that in a series of pulses, a first bi-phasic pulse contains a first portion of a first polarity followed by a second portion of a second polarity; a waiting period of time following the second portion of the first bi-phasic pulse during which period of time no amplitude dependent data bits are encoding, the duration of the period of time being selected to represent a plurality of data bits; and a second biphasic pulse following the period of time, the second biphasic pulse having a third portion of the second polarity followed by a fourth portion of the first polarity, waiting a second period of time following the fourth portion of the second bi-phasic pulse during which period of time no amplitude dependent data bits are encoding, the duration of the period of time being selected to represent a second plurality of data bits, a third bi-phasic pulse contains a first portion of a first polarity followed by a second portion of a second polarity; a waiting period of time following the second portion of the third bi-phasic pulse during which period of time no amplitude

dependent data bits are encoding, the duration of the period of time being selected to represent a third plurality of data bits; and a fourth biphasic pulse following the period of time, the fourth biphasic pulse having a third portion of the second polarity followed by a fourth portion of the first polarity, waiting a fourth period of time following the fourth portion of the second bi-phasic pulse during which period of time no amplitude dependent data bits are encoding, the duration of the period of time being selected to represent a fourth plurality of data bit. Transmitting any sequence indefinitely is not required by the claimed limitations.

Appellant states the specific sequence of data relied upon in the rejection from figure 2 of Omura is a representation of random data and the specific alteration of biphasic pulses is a complete happenstance. The examiner disagrees. Figure 2 discloses a typical sequence of useful and meaningful data that will be transmitted from a transmitter to a desired receiver during data communication. Figure 2 shows how this meaningful data is encoded for transmission via the communication system. The encoded data teaches the limitations of the claims as stated above.

Appellant states Devon does not disclose the duration of time between two pulses represents the data being encoded and PPM is different from the time modulation encoding in the appellant's invention. The examiner disagrees. Claim 25 recites measuring the time between the first and second biphasic pulses and correlating the measured time to a plurality of data bits. Devon states in column 6, lines 5-7, “A receiving device decodes the PPM signals by measuring the time between each pulse received and the previous received pulse.” Subsequent steps

are then applied to further decode the symbol using this measured value (column 6, lines 7-8). Devon discloses a two step process for decoding the symbol where the symbol is decoded by measuring the time between each pulse received and the previous received pulse and according to the pulse window in which it arrived. Since, the time period is measured and used to determine the symbol, the measured time is correlated or represents the encoded data bits. Devon at least suggests the claimed limitations if not directly teaches or discloses the claimed limitations.

Appellant does not argue the individual limitations of claim 23. Therefore, the response to argument for claim 23 is the same as the response to argument of claim 19 as stated above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Kevin M. Burd/

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/David C. Payne/

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